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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/088,907	03/25/2002	Takahiro Kawabata	221139USOPCT	4946

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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
BEISNER, WILLIAM H	

ART UNIT	PAPER NUMBER
1744	

DATE MAILED: 03/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/088,907	KAWABATA ET AL.	
	Examiner	Art Unit	
	William H. Beisner	1744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 March 2002 (Preliminary Amendment)*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statements filed 25 March 2002 and 13 Feb. 2003 have been considered and made of record.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3, 5, 12-15, 21 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Bradley et al.(WO 92/13960).

With respect to claim 1, the reference of Bradley et al. discloses a method of decomposing "hardly decomposable harmful substances" that includes bringing the hardly decomposable substances into contact with microorganisms producing laccase (See Examples 13-31 and page 14, lines 1-11).

With respect to claims 2 and 3, the "hardly decomposable harmful substances" include PCB's (See page 11, lines 22-28).

With respect to claim 5, the microorganisms employed can include *Trametes* (See Page 5, lines 31-34).

With respect to claim 12, dioxins are decomposed in the soil (See Example 14).

With respect to claim 13, the treatment agent for the "hardly decomposable harmful substances" includes microorganisms producing laccase (See Examples 13-31; page 14, lines 1-11 and page 11, lines 15-21).

With respect to claim 14, the sugar beet pulp substrate is considered to meet the instant "mediator" claim language in the absence of further positively recited claim language that defines what the mediator is or does.

With respect to claim 15, the microorganisms employed can include *Trametes* (See Page 5, lines 31-34).

With respect to claims 21 and 22, the "hardly decomposable harmful substances" include PCB's (See page 11, lines 22-28).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bradley et al.(WO 92/13960).

The reference of Bradley et al. has been discussed above.

While the reference of Bradley et al. discloses bioremediation of "hardly decomposable harmful substances", the reference is silent as to the pH of the reaction.

However, in the absence of a showing of criticality and/or unexpected results, it would have been obvious to one of ordinary skill in the art to determine the optimum pH of the reaction while maintaining the viability of the microorganism and efficiency of the bioremediation process.

8. Claims 4 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bradley et al.(WO 92/13960) in view of Khindaria et al.(US 5,556,779).

The reference of Bradley et al. has been discussed above.

While the reference of Bradley et al. discloses the bioremediation of aromatic compounds, the reference is silent as to the bioremediation of halogenated hydrocarbons having 1-4 carbon atoms.

The reference of Khindaria et al. discloses that the microorganisms discussed by the reference of Bradley et al. are also known in the art for bioremediation of halogenated hydrocarbons having 1-4 carbon atoms (See column 5, lines 19-32 and column 6, lines 45-53).

In view of this teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the bioremediation microorganisms of the primary reference of Bradley et al. to bioremediate waste that includes halogenated hydrocarbons as disclosed by the reference of Khindaria et al. for the known and expected result of employing the treatment microorganisms for an art recognized use of treating waste contaminated with halogentated hydrocarbons with 1-4 carbon atoms.

9. Claims 6, 7, 16, 17, 24 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bradley et al.(WO 92/13960) in view of Hunt (US 5,570,973).

The reference of Bradley et al. has been discussed above.

Claims 6 and 16 differ by reciting that the microorganisms or enzyme are carried on a support material.

The reference of Hunt discloses that it is known in the art to provide bioremediation microorganisms on a carrier material (See the abstract).

In view of this teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the microorganisms of the primary reference on the

carriers disclosed by the reference of Hunt for the known and expected result of providing a home for the microorganisms during contacting with the site to be bioremediated.

With respect to claims 7 and 17, the reference discloses the use of a porous ceramic support material (See column 4, lines 3-19).

With respect to claims 24 and 26, the "hardly decomposable harmful substances" include PCB's (See page 11, lines 22-28 of Bradley et al.).

10. Claims 8 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bradley et al.(WO 92/13960) in view of Hunt (US 5,570,973) taken further in view of Kumagai et al.(US 5,962,309).

The combination of the references of Bradley et al. and Hunt has been discussed above.

The above claims differ by reciting that the support material has a cylindrical form using a resin material.

The reference of Kumagai et al. discloses that it is conventional in the art to support microorganisms on cylindrical polymer foam supports (See Figures 1-3).

In view of this teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the microorganisms on the supports disclosed by Kumagai et al. over the porous ceramic supports of Hunt for the known and expected result of providing an alternative means recognized in the art to achieve the same result (See column 1, lines 23-49).

11. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bradley et al.(WO 92/13960) in view of Hunt (US 5,570,973) taken further in view of Khindaria et al.(US 5,556,779).

The combination of the references of Bradley et al. and Hunt has been discussed above.

While the reference of Bradley et al. discloses the bioremediation of aromatic compounds, the reference is silent as to the bioremediation of halogenated hydrocarbons having 1-4 carbon atoms.

The reference of Khindaria et al. discloses that the microorganisms discussed by the reference of Bradley et al. are also known in the art for bioremediation of halogenated hydrocarbons having 1-4 carbon atoms (See column 5, lines 19-32 and column 6, lines 45-53).

In view of this teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the bioremediation microorganisms of the primary reference of Bradley et al. to bioremediate waste that includes halogenated hydrocarbons as disclosed by the reference of Khindaria et al. for the known and expected result of employing the treatment microorganisms for an art recognized use of treating waste contaminated with halogentated hydrocarbons with 1-4 carbon atoms.

12. Claims 9, 19, 25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bradley et al.(WO 92/13960) in view of Hunt (US 5,570,973) taken further in view of Kirschner (US 6,121,038).

The combination of the references of Bradley et al. and Hunt has been discussed above.

Claims 9 and 19 differ by reciting that the enzyme or microorganisms are supported on fine particles of magnetic material.

The reference of Kirschner discloses that it is known in the art to provide bioremediation microorganisms on support material that includes fine particles of magnetic material (See column 2, lines 53-61).

In view of this teaching, it would have been obvious to one of ordinary skill in the art to employ magnetic particles as a support material for the microorganisms for the known and expected result of providing a means recognized in the art for allowing the microorganisms to be recovered from the material to be contacted.

With respect to claims 25 and 27, the "hardly decomposable harmful substances" include PCB's (See page 11, lines 22-28 of Bradley et al.).

13. Claims 10 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bradley et al.(WO 92/13960) in view of Hunt (US 5,570,973) and Kirschner (US 6,121,038) taken further in view of Robinson et al.(US 4,152,210).

The combination of the references of Bradley et al., Hunt and Kirschner has been discussed above.

While the reference of Kirschner discloses the use of magnetic particles, the reference is silent as to the use of particles as recited in claims 10 and 20.

However, the reference of Robinson et al. discloses a list of possible magnetic materials when supporting biologically active material. The list includes ferrites (See column 2, lines 10-25).

In view of this teaching, it would have been obvious to one of ordinary skill in the art to determine the optimum magnetic material from those known in the art while maintaining the efficiency of the contact and retrieval system.

14. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bradley et al.(WO 92/13960) in view of Hunt (US 5,570,973) and Kirschner (US 6,121,038) taken further in view of Khindaria et al.(US 5,556,779).

The combination of the references of Bradley et al., Hunt and Kirschner has been discussed above.

While the reference of Bradley et al. discloses the bioremediation of aromatic compounds, the reference is silent as to the bioremediation of halogenated hydrocarbons having 1-4 carbon atoms.

The reference of Khindaria et al. discloses that the microorganisms discussed by the reference of Bradley et al. are also known in the art for bioremediation of halogenated hydrocarbons having 1-4 carbon atoms (See column 5, lines 19-32 and column 6, lines 45-53).

In view of this teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the bioremediation microorganisms of the primary reference of Bradley et al. to bioremediate waste that includes halogenated hydrocarbons as disclosed by the reference of Khindaria et al. for the known and expected result of employing the treatment microorganisms for an art recognized use of treating waste contaminated with halogentated hydrocarbons with 1-4 carbon atoms.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to William H. Beisner whose telephone number is 571-272-1269. The examiner can normally be reached on Tues. to Fri. and alt. Mon. from 6:15am to 3:45pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert J. Warden can be reached on 571-272-1281. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

William H. Beisner
Primary Examiner
Art Unit 1744

WHB